

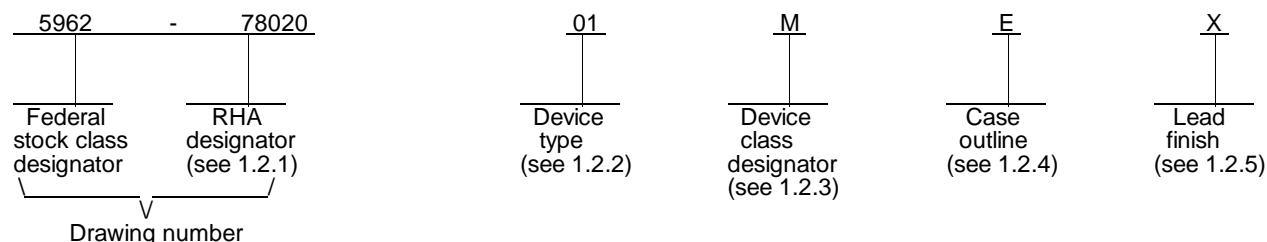
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|--|--|---|---|-----------------------|--|---------------------------------|---|--|
| NOTICE OF REVISION (NOR) THIS REVISION DESCRIBED BELOW HAS BEEN AUTHORIZED FOR THE DOCUMENT LISTED. | | | 1. DATE (YYMMDD) 96-03-28 | | Form Approved OMB No. 0704-0188 | | | |
| <small>Public reporting burden for this collection is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSES. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.</small> | | | | | 2. PROCURING ACTIVITY NO. | | | |
| | | | | | 3. DODAAC | | | |
| 4. ORIGINATOR | | b. ADDRESS (Street, City, State, Zip Code) Defense Electronics Supply Center 1507 Wilmington Pike Dayton, OH 45444-5765 | | 5. CAGE CODE 67268 | | 6. NOR NO. 5962-R089-96 | | |
| a. TYPED NAME (First, Middle Initial, Last) | | | | 7. CAGE CODE 67268 | | 8. DOCUMENT NO. 78020 | | |
| 9. TITLE OF DOCUMENT MICROCIRCUIT, LINEAR, QUAD DIFFERENTIAL LINE RECEIVER, MONOLITHIC SILICON | | | 10. REVISION LETTER | | 11. ECP NO. 78020ECP-1 | | | |
| | | | a. CURRENT K b. NEW L | | | | | |
| 12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES All | | | | | | | | |
| 13. DESCRIPTION OF REVISION Sheet 1: Revisions ltr column; add "L". Revisions description column; add "Changes in accordance with NOR 5962-R089-96". Revisions date column; add "96-03-28". Revision level block; add "L". Rev status of sheets; for sheet 1, 3, 5, 6, and 8 add "L". Sheet 3: Absolute maximum ratings: thermal resistance, junction to ambient, for device types 01-04, 06, for case outline E, change value from 85° C/W to 100° C/W. Revision level block; add "L". Sheet 5: Table I: Enable low current test, I_{IL} , delete minimum value of 0.10 mA. Revision level block; add "L". Sheet 6: Table I: Enable high current sensitivity test, I_{IH} , delete minimum value of -10 μ A. Enable input high current test, I_I , for device types 01-04, 06, delete minimum value of -10 μ A. Revision level block, add "L". Sheet 8: Table I: Output enable time, ENABLE to output, t_{PZL} , for device type 06, subgroup 10, change maximum limit from "60 ns" to "65 ns". t_{PZH} , for device type 06, subgroup 9, change maximum limit from "27 ns" to "35 ns". t_{PZH} , for device type 06, subgroup 10, change maximum limit from "62 ns" to "65 ns". Revision level block, add "L". | | | | | | | | |
| 14. THIS SECTION FOR GOVERNMENT USE ONLY | | | | | | | | |
| a. (X one) | | (1) Existing document supplemented by the NOR may be used in manufacture. (2) Revised document must be received before manufacturer may incorporate this change. (3) Custodian of master document shall make above revision and furnish revised document. | | | | | | |
| | | | | | | | X | |
| | | | | | | | | |
| b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT DESC-ELDS | | | c. TYPED NAME (First, Middle Initial, Last) Michael A. Frye | | | | | |
| d. TITLE Chief, Microelectronics Branch | | e. SIGNATURE Michael A. Frye | | | f. DATE SIGNED (YYMMDD) 96-03-28 | | | |
| 15a. ACTIVITY ACCOMPLISHING REVISION DESC-ELDS | | b. REVISION COMPLETED (Signature) Sandra Rooney | | | c. DATE SIGNED (YYMMDD) 96-03-28 | | | |

| REVISIONS | | | | | | | | | | | | | | | | | | | |
|---|---|--|--|-----------------------------------|--|---|---|---|---|---|---|---------------------------|---|------------------------|------------|----|----|----|----|
| LTR | DESCRIPTION | | | | | | | | | DATE (YR-MO-DA) | | | | | APPROVED | | | | |
| K | Redrawn with changes. Add device type 06. | | | | | | | | | 95-10-31 | | | | | M. A. Frye | | | | |
| THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED. CURRENT CAGE CODE 67268 | | | | | | | | | | | | | | | | | | | |
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| SHEET | | | | | | | | | | | | | | | | | | | |
| REV | K | | | | | | | | | | | | | | | | | | |
| SHEET | 15 | | | | | | | | | | | | | | | | | | |
| REV STATUS OF SHEETS | | | | REV | | K | K | K | K | K | K | K | K | K | K | K | K | K | K |
| | | | | SHEET | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| PMIC N/A | | | | PREPARED BY Monica L. Poelking | | | | | | DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 | | | | | | | | | |
| STANDARD MICROCIRCUIT DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A | | | | CHECKED BY Charles E. Besore | | | | | | | | | | | | | | | |
| | | | | APPROVED BY Michael A. Frye | | | | | | | | | | | | | | | |
| | | | | DRAWING APPROVAL DATE 79-01-26 | | | | | | | | | | | | | | | |
| | | | | REVISION LEVEL K | | | | | | SIZE A | | CAGE CODE 14933 | | 78020 | | | | | |
| | | | | | | | | | | | | | | SHEET 1 OF 15 | | | | | |

1. SCOPE

1.1 Scope. This drawing forms a part of a one part - one part number documentation system (see 6.6 herein). Two product assurance classes consisting of military high reliability (device classes Q and M) and space application (device class V), and a choice of case outlines and lead finishes are available and are reflected in the Part or Identifying Number (PIN). Device class M microcircuits represent non-JAN class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices". When available, a choice of Radiation Hardness Assurance (RHA) levels are reflected in the PIN.

1.2 PIN. The PIN shall be as shown in the following example:



1.2.1 RHA designator. Device class M RHA marked devices shall meet the MIL-I-38535 appendix A specified RHA levels and shall be marked with the appropriate RHA designator. Device classes Q and V RHA marked devices shall meet the MIL-I-38535 specified RHA levels and shall be marked with the appropriate RHA designator. A dash (-) indicates a non-RHA device.

1.2.2 Device type(s). The device type(s) shall identify the circuit function as follows:

| Device type | Generic number | Circuit function |
|-------------|----------------|-------------------------------------|
| 01 | 26LS32 | Quad, differential line receiver 1/ |
| 02 | 26LS33 | Quad, differential line receiver 2/ |
| 03 | 26LS32A | Quad, differential line receiver 1/ |
| 04 | 26LS33A | Quad, differential line receiver 2/ |
| 05 | 26F32 | Quad, differential line receiver 1/ |
| 06 | 26LS32 | Quad, differential line receiver 1/ |

1.2.3 Device class designator. The device class designator shall be a single letter identifying the product assurance level as follows:

| Device class | Device requirements documentation |
|--------------|---|
| M | Vendor self-certification to the requirements for non-JAN class B microcircuits in accordance with 1.2.1 of MIL-STD-883 |
| Q or V | Certification and qualification to MIL-I-38535 |

1.2.4 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835 and as follows:

| Outline letter | Descriptive designator | Terminals | Package style |
|----------------|------------------------|-----------|------------------------------|
| E | GDIP1-T16 or CDIP2-T16 | 16 | Dual-in-line |
| F | GDIP2-F16 or CDFP3-F16 | 16 | Flat package |
| 2 | CQCC1-N20 | 20 | Square leadless chip carrier |

1.2.5 Lead finish. The lead finish shall be as specified in MIL-STD-883 (see 3.1 herein) for class M or MIL-I-38535 for classes Q and V. Finish letter "X" shall not be marked on the microcircuit or its packaging. The "X" designation is for use in specifications when lead finishes A, B, and C are considered acceptable and interchangeable without preference.

1/ Input voltage range (differential or common mode) ± 7 V. Input sensitivity 200 mV.
 2/ Input voltage range (differential or common mode) ± 15 V. Input sensitivity 500 mV.

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1.3 Absolute maximum ratings. 3/

| | | |
|--|------------------|-------------|
| Power supply voltage (V_{CC}) | 7.0 V dc | |
| Common mode range | ± 25 V dc | |
| Differential input voltage | ± 25 V dc | |
| Enable voltage | 7.0 V dc | |
| Output sink current | 50 mA | |
| Storage temperature range | -65°C to +150°C | |
| Power dissipation (P_D) | 500 mW 4/ | |
| Lead temperature (soldering, 10 seconds) | +300°C | |
| Junction temperature (T_J) | +150°C | |
| Thermal resistance, junction-to-case (Θ_{JC}) | See MIL-STD-1835 | |
| Thermal resistance, junction-to-ambient (Θ_{JA}): | Device types | Device type |
| | 01 - 04, 06 | 05 |
| Case outline E | 85°C/W | 100°C/W |
| Case outline F | 140°C/W | 142°C/W |
| Case outline 2 | 130°C/W | 87°C/W |

1.4 Recommended operating conditions.

| | |
|---|------------------------|
| Supply voltage range (V_{CC}) | +4.5 V dc to +5.5 V dc |
| Ambient operating temperature range (T_A) | -55°C to +125°C |
| Minimum high level input voltage (V_{IH}) | 2.0 V dc |
| Maximum low level input voltage (V_{IL}) | 0.8 V dc |
| Input hysteresis (V_{HYST}) | 50 mV typical |

2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, bulletin, and handbook. Unless otherwise specified, the following specification, standards, bulletin, and handbook of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-I-38535 - Integrated Circuits, Manufacturing, General Specification for.

STANDARDS

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-973 - Configuration Management.
MIL-STD-1835 - Microcircuit Case Outlines.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standard Microcircuit Drawings (SMD's).

HANDBOOK

MILITARY

MIL-HDBK-780 - Standardized Military Drawings.

(Copies of the specification, standards, bulletin, and handbook required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

- 3/ Stresses above the absolute maximum rating may cause permanent damage to the device. Extended operation at the maximum levels may degrade performance and affect reliability.
4/ Must withstand the added P_D due to short circuit test, e.g., I_{OS} .

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3. REQUIREMENTS

3.1 Item requirements. The individual item requirements for device class M shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein. The individual item requirements for device classes Q and V shall be in accordance with MIL-I-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-STD-883 (see 3.1 herein) for device class M and MIL-I-38535 for device classes Q and V and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.4 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Test circuit and switching waveforms. The test circuit and switching waveforms shall be as specified on figure 2.

3.3 Electrical performance characteristics and postirradiation parameter limits. Unless otherwise specified herein, the electrical performance characteristics and postirradiation parameter limits are as specified in table I and shall apply over the full ambient operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are defined in table I.

3.5 Marking. The part shall be marked with the PIN listed in 1.2 herein. Marking for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein). In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103. Marking for device classes Q and V shall be in accordance with MIL-I-38535.

3.5.1 Certification/compliance mark. The compliance mark for device class M shall be a "C" as required in MIL-STD-883 (see 3.1 herein). The certification mark for device classes Q and V shall be a "QML" or "Q" as required in MIL-I-38535.

3.6 Certificate of compliance. For device class M, a certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.7.2 herein). For device classes Q and V, a certificate of compliance shall be required from a QML-38535 listed manufacturer in order to supply to the requirements of this drawing (see 6.7.1 herein). The certificate of compliance submitted to DESC-EC prior to listing as an approved source of supply for this drawing shall affirm that the manufacturer's product meets, for device class M, the requirements of MIL-STD-883 (see 3.1 herein), or for device classes Q and V, the requirements of MIL-I-38535 and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required for device class M in MIL-STD-883 (see 3.1 herein) or for device classes Q and V in MIL-I-38535 shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change for device class M. For device class M, notification to DESC-EC of change of product (see 6.2 herein) involving devices acquired to this drawing is required for any change as defined in MIL-STD-973.

3.9 Verification and review for device class M. For device class M, DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

3.10 Microcircuit group assignment for device class M. Device class M devices covered by this drawing shall be in microcircuit group number 53 (see MIL-I-38535, appendix A).

3.11 PIN supersession information. The PIN supersession information shall be as specified in the appendix.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. For device class M, sampling and inspection procedures shall be in accordance with MIL-STD-883 (see 3.1 herein). For device classes Q and V, sampling and inspection procedures shall be in accordance with MIL-I-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

4.2 Screening. For device class M, screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. For device classes Q and V, screening shall be in accordance with MIL-I-38535, and shall be conducted on all devices prior to qualification and technology conformance inspection.

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TABLE I. Electrical performance characteristics.

| Test | Symbol | Conditions -55°C ≤ T _A ≤ +125°C unless otherwise specified | | Group A subgroups | Device type | Limits | | Unit |
|---|-----------------|--|------------------------------------|----------------------|----------------|--------|-------|------|
| | | | | | | Min | Max | |
| Differential input voltage sensitivity | V _{TH} | V _{OUT} = V _{OL} or V _{OH} | -7 V ≤ V _{CM} ≤ +7 V | 1, 2, 3 | 01,03 05,06 | -0.2 | +0.2 | V |
| | | | -15 V ≤ V _{CM} ≤ +15 V | | 02,04 | -0.5 | +0.5 | |
| Input resistance 1/ | R _{IN} | -15 V ≤ V _{CM} ≤ +15 V (one input ac ground) | | 4, 5, 6 | 01,02 06 | 6.0 | | kΩ |
| | | | | | 03,04 | 12.0 | | |
| | | | | | 05 | 14.0 | | |
| Input current (under test) | I _{IN} | V _{IN} = 15 V (other input -15 V ≤ V _{IN} ≤ 15 V) | | 1, 2, 3 | 01,02 05,06 | | 2.3 | mA |
| | | V _{IN} = -15 V (other input -15 V ≤ V _{IN} ≤ 15 V) | | | | | -2.8 | |
| | | V _{IN} = -15 V (other input -10 V ≤ V _{IN} ≤ 15 V) | | | 03,04 | | 2.3 | |
| | | V _{IN} = -15 V (other input -15 V ≤ V _{IN} ≤ 10 V) | | | | | -2.8 | |
| Output high voltage (3006) | V _{OH} | V _{CC} = 4.5 V, ΔV _{IN} = 1.0 V, V _{ENABLE} 0.8 V, I _{OH} = -440 μA | | 1, 2, 3 | All | 2.5 | | V |
| Output low voltage (3007) | V _{OL} | V _{CC} = 4.5 V V _{ENABLE} = 0.8 V ΔV _{IN} = -1.0 V | I _{OL} = 4.0 mA | 1, 2, 3 | All | | 0.4 | V |
| | | | I _{OL} = 8.0 mA | | | | 0.45 | |
| Enable low voltage | V _{IL} | V _{CC} = 5.5 V 2/ | | 1, 2, 3 | All | | 0.8 | V |
| Enable high voltage | V _{IH} | V _{CC} = 4.5 V 2/ | | 1, 2, 3 | All | 2.0 | | V |
| Enable clamp voltage (3022) | V _{IC} | V _{CC} = 4.5 V, I _{IN} = -18 mA V _{CC} = 5.5 V 2/ | | 1, 2, 3 | All | | -1.5 | V |
| Off-state (high impedance) output current (3021) | I _O | V _{CC} = 5.5 V | V _O = 2.4 V | 1, 2, 3 | All | | 20 | μA |
| | | | V _O = 0.4 V | | | | -20 | |
| Enable low current (3009) | I _{IL} | V _{IN} = 0.4 V, V _{CC} = 5.5 V 3/ | | 1, 2, 3 | All | 0.10 | -0.36 | mA |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _A ≤ +125°C unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|--|------------------|---|---------------------------------------|----------------|--------|-----------|------|
| | | | | | Min | Max | |
| Enable high current (3010) sensitivity | I _{IH} | V _{IN} = 2.7 V, V _{CC} = 5.5 V <u>3/</u> | 1, 2, 3 | All | -10 | 20 | μA |
| Output short circuit current (3011) | I _{OS} | V _O = 0 V, V _{CC} = 5.5 V <u>4/</u> ΔV _{IN} = 1.0 V | 1, 2, 3 | All | -15 | -85 | mA |
| Supply current (3005) | I _{CC} | V _{CC} = 5.5 V, data inputs = GND, outputs disabled | 1, 2, 3 | 01-04 06 | | 70 | mA |
| | | | | 05 | | 50 | |
| Enable input high current | I _I | V _{IN} = 5.5 V, V _{CC} = 5.5 V <u>3/</u> | 1, 2, 3 | 01-04 06 | -10 | 100 | μA |
| | | | | 05 | -10 | 50 | |
| Propagation delay, input to output (3003) | t _{PLH} | V _{CC} = 5.0 V, C _L = 15 pF See figure 3 | 9 10, 11 | 01,02 | | 25 38 | ns |
| | | | 9 10, 11 | 03,04 | | 35 53 | |
| | | | C _L = 50 pF 9 10, 11 | 05 | | 23 31 | |
| | | | 9, 11 10 | 06 | | 30 120 | |
| | | | 9 10, 11 | 05 5/ | | 22 30 | |
| | | | 9 10, 11 | 01,02 | | 25 38 | |
| | t _{PHL} | | 9 10, 11 | 03,04 | | 35 53 | |
| | | | C _L = 50 pF 9 10, 11 | 05 | | 23 31 | |
| | | | 9, 11 10 | 06 | | 30 120 | |
| | | | 9 10, 11 | 05 5/ | | 22 30 | |
| | | | | | | | |
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See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|---|-----------|--|-------------------------------------|------------------|--------|----------------|------|
| | | | | | Min | Max | |
| Output disable time, ENABLE to output (3003) | t_{PLZ} | $V_{CC} = 5.0\text{ V}$, $C_L = 5\text{ pF}$ See figure 3 | 9 10, 11 | 01,02 | | 30 45 | ns |
| | | | 9 10, 11 | 03,04 | | 40 60 | |
| | | | $C_L = 50\text{ pF}$ 9 10, 11 | 05 | | 18 30 | |
| | | | 9 10 11 | 06 | | 34 64 27 | |
| | | | 9 10, 11 | 05 <u>5</u> / | | 18 20 | |
| | | | 9 10, 11 | 01,02 | | 22 33 | |
| | t_{PHZ} | $C_L = 50\text{ pF}$ | 9 10, 11 | 03,04 | | 30 45 | |
| | | | 9 10, 11 | 05 | | 55 62 | |
| | | | 9, 11 10 | 06 | | 32 35 | |
| | | | 9 10, 11 | 05 <u>5</u> / | | 20 27 | |
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See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ unless otherwise specified | Group A subgroups | Device type | Limits | | Unit |
|--|------------------|--|-----------------------|----------------|--------|----------------|------|
| | | | | | Min | Max | |
| Output enable time, ENABLE to output (3003) | t_{PZL} | $V_{\text{CC}} = 5.0 \text{ V}$, $C_L = 15 \text{ pF}$ See figure 3 | 9 10, 11 | 01,02 | | 22 33 | ns |
| | | | 9 10, 11 | 03,04 | | 25 38 | |
| | | | $C_L = 50 \text{ pF}$ | 9 10, 11 | 05 | 20 29 | |
| | | | | 9 10 11 | 06 | 34 60 27 | |
| | | | 9 10, 11 | 05 5/ | | 18 27 | |
| | | | 9 10, 11 | 01,02 | | 22 33 | |
| | t_{PHZ} | | 9 10, 11 | 03,04 | | 25 38 | |
| | | | $C_L = 50 \text{ pF}$ | 9 10, 11 | 05 | 18 29 | |
| | | | | 9, 11 10 | 06 | 27 62 | |
| | | | 9 10, 11 | 05 5/ | | 16 27 | |

1/ Guaranteed by design.

2/ The V_{IH} and V_{IL} tests are not required and shall be applied as forcing functions for the V_{OL} and V_{OH} tests.3/ These limits are not tested. The limits specified for the input low current represent the numerical range in which this parameter will pass: -0.36 to $+0.10$.

4/ Not more than output should be shorted at one time and the duration of the short circuit condition should not exceed one second.

5/ This parameter is guaranteed by correlation to the testing at $C_L = 50 \text{ pF}$.

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| | | |
|-----------------|-----------------|----------|
| Case outlines | 2 | E, F |
| Device types | All | |
| Terminal number | Terminal symbol | |
| 1 | NC | INPUT A- |
| 2 | INPUT A- | INPUT A+ |
| 3 | INPUT A+ | OUTPUT A |
| 4 | OUTPUT A | ENABLE |
| 5 | ENABLE | OUTPUT C |
| 6 | NC | INPUT C+ |
| 7 | OUTPUT C | INPUT C- |
| 8 | INPUT C+ | GND |
| 9 | INPUT C- | INPUT D- |
| 10 | GND | INPUT D+ |
| 11 | NC | OUTPUT D |
| 12 | INPUT D- | ENABLE |
| 13 | INPUT D+ | OUTPUT B |
| 14 | OUTPUT D | INPUT B+ |
| 15 | ENABLE | INPUT B- |
| 16 | NC | V_{CC} |
| 17 | OUTPUT B | ---- |
| 18 | INPUT B+ | ---- |
| 19 | INPUT B- | ---- |
| 20 | V_{CC} | ---- |

FIGURE 1. Terminal connections.

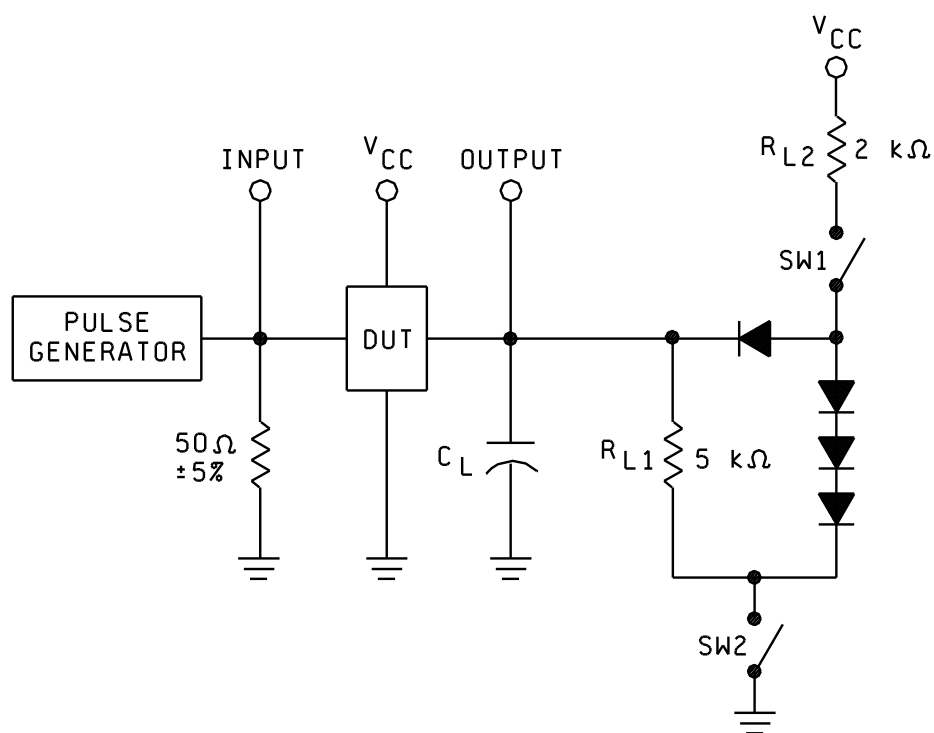
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| Switch matrix | | |
|---------------|--------|--------|
| Parameter | SW1 | SW2 |
| t_{PLH} | Closed | Closed |
| t_{PHL} | Closed | Closed |
| t_{PZL} | Closed | Open |
| t_{PZH} | Open | Closed |
| t_{PLZ} | Closed | Closed |
| t_{PHZ} | Closed | Closed |

NOTES:

1. Pulse generator, rate ≤ 10 MHz, $Z_O = 50 \Omega$, $t_r \leq 5.0$ ns, $t_f \leq 5.0$ ns.
2. All diodes, 1N916 or 1N3064

FIGURE 2. Test circuit and switching waveforms.

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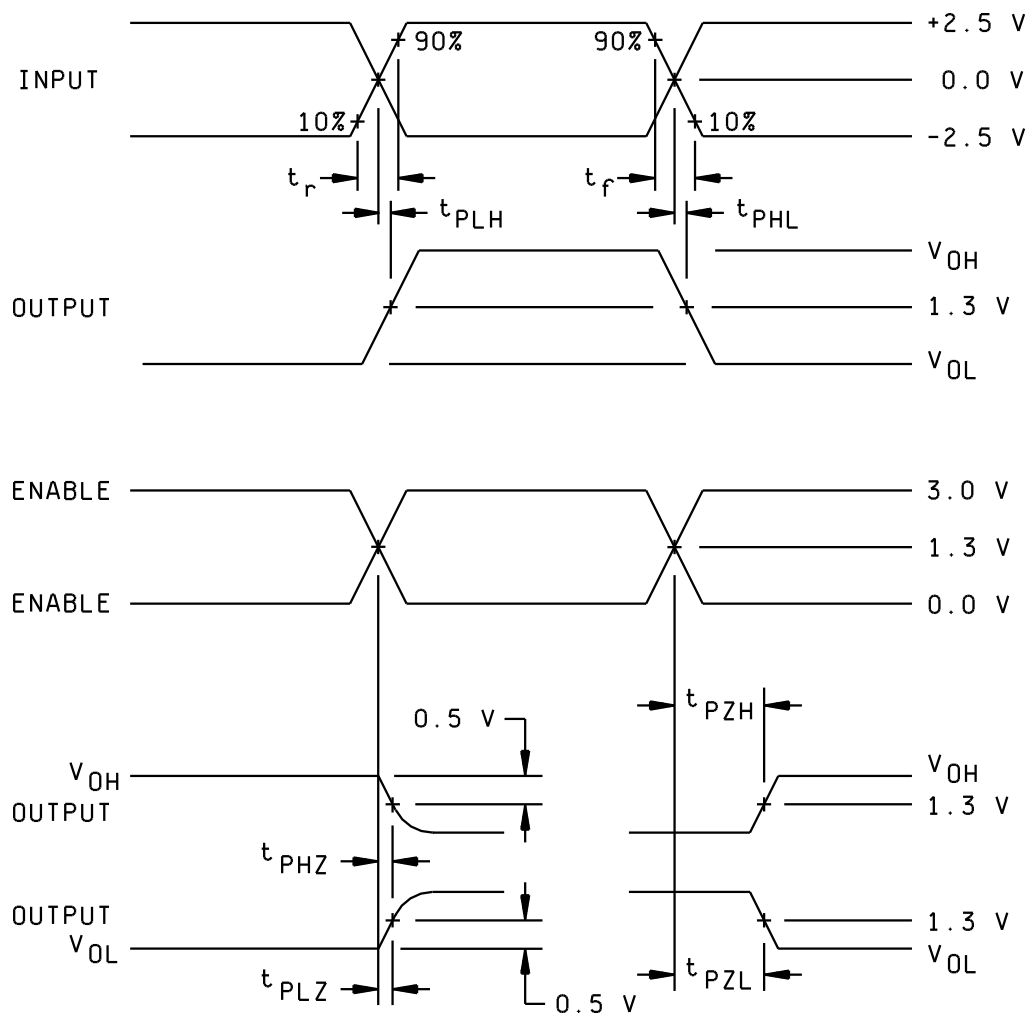


FIGURE 3. Test circuit and switching waveforms - Continued.

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4.2.1 Additional criteria for device class M.

- a. Burn-in test, method 1015 of MIL-STD-883.
 - (1) Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.
 - (2) $T_A = +125^\circ\text{C}$, minimum.
- b. Interim and final electrical test parameters shall be as specified in table II herein.

4.2.2 Additional criteria for device classes Q and V.

- a. The burn-in test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The burn-in test circuit shall be maintained under document revision level control of the device manufacturer's Technology Review Board (TRB) in accordance with MIL-I-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015.
- b. Interim and final electrical test parameters shall be as specified in table II herein.
- c. Additional screening for device class V beyond the requirements of device class Q shall be as specified in appendix B of MIL-I-38535.

4.3 Qualification inspection for device classes Q and V. Qualification inspection for device classes Q and V shall be in accordance with MIL-I-38535. Inspections to be performed shall be those specified in MIL-I-38535 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4).

4.4 Conformance inspection. Quality conformance inspection for device class M shall be in accordance with MIL-STD-883 (see 3.1 herein) and as specified herein. Inspections to be performed for device class M shall be those specified in method 5005 of MIL-STD-883 and herein for groups A, B, C, D, and E inspections (see 4.4.1 through 4.4.4). Technology conformance inspection for classes Q and V shall be in accordance with MIL-I-38535 including groups A, B, C, D, and E inspections and as specified herein except where option 2 of MIL-I-38535 permits alternate in-line control testing.

4.4.1 Group A inspection.

- a. Tests shall be as specified in table II herein.
- b. Subgroups 7 and 8 in table I, method 5005 of MIL-STD-883 shall be omitted.

4.4.2 Group C inspection. The group C inspection end-point electrical parameters shall be as specified in table II herein.

4.4.2.1 Additional criteria for device class M. Steady-state life test conditions, method 1005 of MIL-STD-883:

- a. Test condition A, B, C, or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005.
- b. $T_A = +125^\circ\text{C}$, minimum.
- c. Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.4.2.2 Additional criteria for device classes Q and V. The steady-state life test duration, test condition and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-I-38535. The test circuit shall be maintained under document revision level control by the device manufacturer's TRB, in accordance with MIL-I-38535, and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005.

4.4.3 Group D inspection. The group D inspection end-point electrical parameters shall be as specified in table II herein.

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TABLE II. Electrical test requirements.

| Test requirements | Subgroups (in accordance with MIL-STD-883, TM 5005, table I) | Subgroups (in accordance with MIL-I-38535, table III) | |
|--|---|---|--------------------------------|
| | Device class M | Device class Q | Device class V |
| Interim electrical parameters (see 4.2) | ---- | 1 | 1 |
| Final electrical parameters (see 4.2) | 1, 2, 3, 9 <u>1/</u> | 1, 2, 3, 9 <u>1/</u> | 1, 2, 3, 9 <u>2/</u> |
| Group A test requirements (see 4.4) | 1, 2, 3, 4, 5, 6 9, 10, 11 <u>3/</u> | 1, 2, 3, 4, 5, 6 9, 10, 11 | 1, 2, 3, 4, 5, 6, 9, 10, 11 |
| Group C end-point electrical parameters (see 4.4) | 1, 2, 3 | 1, 2, 3 | ---- |
| Group D end-point electrical parameters (see 4.4) | 1, 2, 3 | 1, 2, 3 | 1, 2, 3 |
| Group E end-point electrical parameters (see 4.4) | ---- | ---- | ---- |

1/ PDA applies to subgroup 1.

2/ PDA applies to subgroup 1 and delta limits. Delta limits shall be in accordance with table IIB and shall be computed with reference to the previous interim electrical parameters.

3/ Subgroups 4, 5, 6, 10, and 11, if not tested, shall be guaranteed to the specified limits in table I.

TABLE IIB. Delta limits at +25° C.

| Parameter <u>1/</u> | Device type | Limit |
|---------------------|----------------|----------------|
| V_{OH} | All | ≤ 250 mV |
| V_{OL} | All | ≤ 45 mV |
| I_{IN} | All | ≤ 0.28 mA |

1/ These parameters shall be read and recorded at $T_A = +25^\circ\text{C}$ before and after each burn-in and shall not change by more than the limits indicated. The delta rejects shall be included in the PDA calculation.

4.4.4 Group E inspection. Group E inspection is required only for parts intended to be marked as radiation hardness assured (see 3.5 herein). RHA levels for device classes Q and V shall be M, D, L, R, F, G, and H and for device class M shall be M and D.

- End-point electrical parameters shall be as specified in table II herein.
- For device class M, the devices shall be subjected to radiation hardness assured tests as specified in MIL-I-38535, appendix A, for the RHA level being tested. For device classes Q and V, the devices or test vehicle shall be subjected to radiation hardness assured tests as specified in MIL-I-38535 for the RHA level being tested. All device classes must meet the postirradiation end-point electrical parameter limits as defined in table I at $T_A = +25^\circ\text{C} \pm 5^\circ\text{C}$, after exposure, to the subgroups specified in table II herein.
- When specified in the purchase order or contract, a copy of the RHA delta limits shall be supplied.

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5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-STD-883 (see 3.1 herein) for device class M and MIL-I-38535 for device classes Q and V.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use for Government microcircuit applications (original equipment), design applications, and logistics purposes.

6.1.1 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.1.2 Substitutability. Device class Q devices will replace device class M devices.

6.2 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-973 using DD Form 1692, Engineering Change Proposal.

6.3 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and which SMD's are applicable to that system. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronic devices (FSC 5962) should contact DESC-EC, telephone (513) 296-6047.

6.4 Comments. Comments on this drawing should be directed to DESC-EC, Dayton, Ohio 45444-5270, or telephone (513) 296-5377.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-I-38535 and MIL-STD-1331.

6.6 One part - one part number system. The one part - one part number system described below has been developed to allow for transitions between identical generic devices covered by the three major microcircuit requirements documents (MIL-H-38534, MIL-I-38535, and 1.2.1 of MIL-STD-883) without the necessity for the generation of unique PIN's. The three military requirements documents represent different class levels, and previously when a device manufacturer upgraded military product from one class level to another, the benefits of the upgraded product were unavailable to the Original Equipment Manufacturer (OEM), that was contractually locked into the original unique PIN. By establishing a one part number system covering all three documents, the OEM can acquire to the highest class level available for a given generic device to meet system needs without modifying the original contract parts selection criteria.

| <u>Military documentation format</u> | <u>Example PIN under new system</u> | <u>Manufacturing source listing</u> | <u>Document listing</u> |
|---|-------------------------------------|-------------------------------------|-------------------------|
| New MIL-H-38534 Standard Microcircuit Drawings | 5962-XXXXXZZ(H or K)YY | QML-38534 | MIL-BUL-103 |
| New MIL-I-38535 Standard Microcircuit Drawings | 5962-XXXXXZZ(Q or V)YY | QML-38535 | MIL-BUL-103 |
| New 1.2.1 of MIL-STD-883 Standard Microcircuit Drawings | 5962-XXXXXZZ(M)YY | MIL-BUL-103 | MIL-BUL-103 |

6.7 Sources of supply.

6.7.1 Sources of supply for device classes Q and V. Sources of supply for device classes Q and V are listed in QML-38535. The vendors listed in QML-38535 have submitted a certificate of compliance (see 3.6 herein) to DESC-EC and have agreed to this drawing.

6.7.2 Approved sources of supply for device class M. Approved sources of supply for class M are listed in MIL-BUL-103. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-EC.

6.7.3 Caution to designers. Device type 01 (26LS32) previously supplied by vendor 27014 (National Semiconductor) was manufactured without a failsafe input/output design (output is always high when inputs are open) which is common to device type 01 supplied by vendors 34335 (Advanced Micro Devices, Inc.) and 01295 (Texas Instruments). This difference may require variations in system circuit design when substitution between vendors is made.

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APPENDIX

10. SCOPE

10.1 Scope. This appendix contains the PIN supersession information to support the one part - one part number system. For new system designs, after the date of this document the new PIN shall be used in lieu of the old PIN. For existing system designs prior to the date of this document the new PIN can be used in lieu of the old PIN. This is a mandatory part of the specification. The information contained herein is intended for compliance. The PIN supersession data shall be as specified in 30.

20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

30. SUPERSESSION DATA

| <u>New PIN</u> | <u>Old PIN</u> |
|-----------------|----------------|
| 5962-7802001MEX | 7802001EX |
| 5962-7802001MFX | 7802001FX |
| 5962-7802001M2X | 78020012X |
| 5962-7802002MEX | 7802002EX |
| 5962-7802002MFX | 7802002FX |
| 5962-7802002M2X | 78020022X |
| 5962-7802003MEX | 7802003EX |
| 5962-7802003MFX | 7802003FX |
| 5962-7802003M2X | 78020032X |
| 5962-7802004MEX | 7802004EX |
| 5962-7802004MFX | 7802004FX |
| 5962-7802004M2X | 78020042X |

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STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN

DATE: 95-10-31

Approved sources of supply for SMD 78020 are listed below for immediate acquisition only and shall be added to MIL-BUL-103 during the next revision. MIL-BUL-103 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DESC-EC. This bulletin is superseded by the next dated revision of MIL-BUL-103.

| Standard microcircuit drawing PIN | Vendor CAGE number | Vendor similar PIN <u>1</u> / |
|-----------------------------------|------------------------------|-------------------------------|
| 5962-7802001MEA <u>2</u> / | 04713 18324 <u>3</u> / | 26LS32/BEAJC 26LS32/BEA |
| 5962-7802001MFA <u>2</u> / | 04713 18324 <u>3</u> / | 26LS32/BFAJC 26LS32/BFA |
| 5962-7802001M2A <u>2</u> / | 04713 18324 <u>3</u> / | 26LS32/B2AJC 26LS32/B2A |
| 5962-7802002MEA | 18324 | 26LS33/BEA |
| 5962-7802002MFA | <u>4</u> / | AM26LS33/BFA |
| 5962-7802002M2A | <u>4</u> / | AM26LS33/B2A |
| 5962-7802003MEA | 18324 01295 | 26LS32A/BEA AM26LS32AMJB |
| 5962-7802003MFA | 18324 01295 | 26LS32A/BFA AM26LS32AMWB |
| 5962-7802003M2A | 18324 01295 | 26LS32A/B2A AM26LS32AMFKB |
| 5962-7802004MEA | 18324 01295 | 26LS33A/BEA AM26LS33AMJB |
| 5962-7802004MFA | 01295 | AM26LS33AMWB |
| 5962-7802004M2A | 01295 | AM26LS33AMFKB |
| 5962-7802005MEA | 27014 | DS26F32MJ/883 |
| 5962-7802005MFA | 27014 | DS26F32MW/883 |
| 5962-7802005M3A | 27014 | DS26F32M3/883 |

STANDARD MICROCIRCUIT DRAWING SOURCE APPROVAL BULLETIN - CONTINUED

| Standard microcircuit drawing PIN | Vendor CAGE number | Vendor similar PIN <u>1/</u> |
|-----------------------------------|--------------------|------------------------------|
| 5962-7802006QEA | 27014 | DS26LS32MJ/883 |
| 5962-7802006QFA | 27014 | DS26LS32MW/883 |
| 5962-7802006Q2A | 27014 | DS26LS32ME/883 |

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

2/ Caution. The device type 01 previously supplied by vendor 27014 (National Semiconductor) was manufactured without a failsafe input/output design (output always high when inputs are open) which is common to the device type 01 supplied by vendors 34335 (Advanced Micro Devices, Inc.) and 01295 (Texas Instruments). This difference may require variations in system circuit design when substitution between vendors is made.

3/ Vendor CAGE 04713 has announced end of life date of September 30, 1995 for these parts. They will continue to manufacture parts until all orders are filled.

4/ Not available from an approved source of supply.

| <u>Vendor CAGE number</u> | <u>Vendor name and address</u> |
|---------------------------|--|
| 04713 | Motorola, Incorporated 5005 E. McDowell Road Phoenix, AZ 85008 Point of contact: 2100 E. Elliot Road Tempe, AZ 85284 |
| 27014 | National Semiconductor 2900 Semiconductor Drive P.O. Box 58090 Santa Clara, CA 95052-8090 |
| 18324 | Philips Semiconductors 990 Benecia Ave Sunnyvale, CA 94086 Point of contact: 811 E. Arques Ave Sunnyvale, CA 94088-3409 |
| 01295 | Texas Instruments, Incorporated 13500 N. Central Expressway P.O. Box 655303 Dallas, TX 75265 Point of contact: I-20 at FM 1788 Midland, TX 79711-0448 |

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